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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,732	10/17/2003	Myung Seop Kim	K-0546	8331
34610	7590	05/04/2004	EXAMINER	
FLESHNER & KIM, LLP P.O. BOX 221200 CHANTILLY, VA 20153			LEURIG, SHARLENE L	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 05/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/686,732	KIM ET AL.	
	Examiner	Art Unit	
	Sharlene Leurig	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 8 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the language of claim renders the claim indefinite, as it is unclear whether the phrase "having a stack of at least one transparent thin film layer" is directed to the second electrode or the organic light emitting layer. For the purposes of continued examination, the claim will be interpreted as meaning that the second electrode has a stack of at least one transparent thin film layer.

Regarding claim 8, the language of claim renders the claim indefinite, as it is unclear whether the phrase "having at least one transparent thin film layer" is directed to the second electrode or the protection layer. For the purposes of continued examination, the claim will be interpreted as meaning that the protection layer has at least one transparent thin film layer.

Regarding claim 11, the language of claim renders the claim indefinite, as it is unclear whether the phrase "having alternate stack of at least one metal layer and at least a transparent thin film layer" is directed to the second electrode or the organic light emitting layer. For the purposes of continued examination, the claim will be interpreted as meaning that the second electrode has a stack of at least one transparent thin film

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layer. Furthermore, it is unclear whether the phrase "having a stack of at least one transparent thin film layer" is directed to the second electrode or the protection layer. For the purposes of continued examination, the claim will be interpreted as meaning that the protection layer has at least one transparent thin film layer.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Graff et al. (6,522,067).

Regarding claim 1, Graff discloses an organic electroluminescent device comprising a substrate (Figure 1, element 105), a first electrode (200) on the substrate, an organic emitting layer (210) on the first electrode, and a second electrode (220) on the organic emitting layer having a stack of at least one transparent thin film layer.

Regarding claim 8, Graff discloses a protection layer (130) on the second electrode having at least one transparent thin film layer.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of the applicant's admission of the prior art.

Graff discloses an OLED having first and second transparent electrodes sandwiching an organic light emitting layer (column 3, line 58).

Graff fails to exemplify the material forming the electrodes.

The applicant's admission of the prior art teaches a transparent first electrode in an OLED being made of ITO (page 2, paragraph 0004).

Regarding claim 3, Graff discloses hole and electron transport layers (230 and 235) forming the organic light emitting layer (210), but fails to exemplify separate hole injecting, electron injecting and emissive layers as well.

The applicant's admission of the prior art teaches an OLED having a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer formed on the first electrode in succession.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer in order to improve the performance of the device by providing

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specialized layers, as the applicant's admission of the prior art has taught those layers to be well known.

7. Claims 2, 4-7, 11, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of Furugori et al. (US 2002/0180350 A1).

Graff discloses an OLED having transparent first and second electrodes sandwiching an organic light emitting layer (column 3, line 58) and a protection film on the second electrode having a stack of at least one transparent thin film layer.

Graff fails to exemplify the material or structure of the electrodes.

Regarding claims 2 and 12, Furugori teaches an OLED having a first electrode formed of ITO for transparency (paragraph 0079).

Regarding claims 4-7, 11, 14 and 15, Furugori teaches a second electrode having a two-layer structure comprising a first layer of metal such as Al:Li with a second transparent layer of ITO formed thereon, where the first and second layers are alternately formed (page 4, paragraph 0063).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have first and second electrodes formed of transparent materials such as ITO and Al:Li, as taught by Furugori, in order to allow the light to be emitted from both sides of the device.

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8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of Kubota et al. (US 2002/0113241 A1).

Graff discloses an OLED having a protection film formed over the second electrode, including three layers in a polymer-nitride barrier-polymer sequence in order to protect the device from degradation due to moisture and oxygen.

Graff fails to exemplify a protection layer having four layers in total.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of Kubota et al. (US 2002/0113241 A1) as applied to claim 9 above, and further in view of Uchida et al. (5,912,061).

Graff discloses an OLED having a protection film formed over the second electrode, including three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and

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oxygen (column 2, lines 28-34; column 2, lines 9-17). Graff discloses that the two polymer layers can be formed of different materials (column 2, lines 33-35).

Graff fails to exemplify a protection layer having a layer of a fluoride polymer.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Graff further fails to exemplify the types of acrylate polymers that can be used for the polymer layers.

Uchida teaches acrylate polymers used as protective coatings including a silicon compound of an acryl group, silicon acrylate (column 9, line 34) and many other types of acrylate, including stearyl acrylate (column 9, line 53).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation, and to use stearyl acrylate for the first polymer layer over the second electrode and silicon acrylate for the third polymer layer, as Uchida has taught these acrylates as having good protective qualities.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of Furugori et al. (US 2002/0180350 A1) as applied to claims 2,

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4-7, 11, 12, 14 and 15 above, and further in view of the applicant's admission of the prior art.

Graff discloses an OLED having transparent (column 3, line 58) first and second electrodes formed on a substrate and sandwiching an organic light emitting layer and a protection film on the second electrode having a stack of at least one transparent thin film layer. Graff discloses hole and electron transport layers (230 and 235) forming the organic light emitting layer (210).

Graff fails to exemplify the material or structure of the electrodes.

Furugori teaches a second electrode having a two-layer structure comprising a first layer of metal such as Al:Li with a second transparent layer of ITO formed thereon, (page 4, paragraph 0063).

Graff further fails to exemplify separate hole injecting, electron injecting and emissive layers.

The applicant's admission of the prior art teaches an OLED having a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer formed on the first electrode in succession.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have to a second electrode formed of a first metal layer and a second transparent material, as taught by Furugori, in order to allow the light to be emitted from both sides of the device, and to further modify the device to have a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer in order to improve the

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performance of the device by providing specialized layers, as the applicant's admission of the prior art has taught those layers to be well known.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of Furugori et al. (US 2002/0180350 A1) as applied to claims 2, 4-7, 11, 12, 14 and 15 above, and further in view of Kubota et al. (US 2002/0113241 A1).

Graff discloses an OLED having transparent (column 3, line 58) first and second electrodes formed on a substrate and sandwiching an organic light emitting layer and a protection film on the second electrode having a stack of at least one transparent thin film layer. Graff discloses the protection film formed as having three layers in a polymer-nitride barrier-polymer sequence in order to protect the device from degradation due to moisture and oxygen.

Graff fails to exemplify the material or structure of the electrodes.

Furugori teaches a second electrode having a two-layer structure comprising a first layer of metal such as Al:Li with a second transparent layer of ITO formed thereon, (page 4, paragraph 0063).

Graff further fails to exemplify a protection layer having four layers in total.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a second electrode formed of a first metal layer and a second transparent material, as taught by Furugori, in order to allow the light to be emitted from both sides of the device, and to further modify the device to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff et al. (6,522,067) in view of Furugori et al. (US 2002/0180350 A1) and further in view of Kubota et al. (US 2002/0113241 A1) as applied to claim 16 above, and further in view of Uchida et al. (5,912,061).

Graff discloses an OLED having transparent (column 3, line 58) first and second electrodes sandwiching an organic light emitting layer and a protection film on the second electrode having three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and oxygen (column 2, lines 28-34; column 2, lines 9-17). Graff discloses that the two polymer layers can be formed of different materials (column 2, lines 33-35).

Graff fails to exemplify the material or structure of the electrodes.

Furugori teaches a second electrode having a two-layer structure comprising a first layer of metal such as Al:Li with a second transparent layer of ITO formed thereon, (page 4, paragraph 0063).

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Graff further fails to exemplify a protection layer having four layers in total.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Graff further fails to exemplify the types of acrylate polymers that can be used for the polymer layers.

Uchida teaches acrylate polymers used as protective coatings including a silicon compound of an acryl group, silicon acrylate (column 9, line 34) and many other types of acrylate, including stearyl acrylate (column 9, line 53).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OLED of Graff to have a second electrode formed of a first metal layer and a second transparent material, as taught by Furugori, in order to allow the light to be emitted from both sides of the device, to further modify the device to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation, and to use stearyl acrylate for the first polymer layer over the second electrode and silicon acrylate for the third polymer layer, as Uchida has taught these acrylates as having good protective qualities.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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